REMARKS

Claims 1-12 are the claims pending in the application.

The specification has been amended to "Examples of the 2-oxetanyl" to "Examples of the 3-oxetanyl" on page 6, line 19.

Entry of the above amendments is respectfully requested.

I. Response to Rejection of Claims 1, 2 and 9 under 35 U.S.C. § 102(b)

Claims 1, 2, and 9 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Nakagawa et al. (WO 01/75991; US 2003/0064282 A1) is relied upon as an equivalent document for convenience.

Applicants respectfully traverse the rejection.

Independent claim 1 is directed to a crosslinking polymer-supported porous film for battery separator, the crosslinking polymer-supported porous film comprising: a porous film substrate; and a polymer layer formed on the porous film substrate so as to be in contact with the porous film substrate. The polymer layer comprises a crosslinking polymer in a state that the crosslinking polymer is not polymerized, the crosslinking polymer having plural cation-polymerizable functional groups in the molecule and being polymerizable in the presence of cation wherein the porous film has a porosity of 20-95 %.

Nakagawa discloses that a crosslinked material layer is formed on a porous material (separator). *See e.g.,* [0024]-[0025] and [0042]. In this regard, Nakagawa discloses the advantage that the crosslinked material layer, which is crosslinked by the polymerization of the crosslinkable monomer, exhibits excellent durability against high temperature and repetition temperature change and can stably maintain its structure over an extended period of time. *See* [0060]. Therefore, in Nakagawa, there is a necessity that the crosslinkable monomer is

crosslinked (i.e., in the state of being "previously-crosslinked") in order to obtain the above-mentioned advantage.

On the other hand, claim 1 recites "the polymer layer comprising a crosslinking polymer in a state that the crosslinking polymer is not polymerized". Thus, in the present invention, the non-polymerized polymer (not crosslinked), which has a reactivity, is formed on the porous film (separator). In addition, in the present invention, it is important that the crosslinking polymer is not polymerized for the novel function (i.e., adhesion between electrode and separator) which is not disclosed in Nakagawa.

Furthermore, Nakagawa discloses that the crosslinked layer is formed from at least one monomer having an unsaturated bond, monomer having an epoxy group, or a monomer having an isocyanates group. *See* [0025]. Nakagawa further discloses that the separator can be prepared by coating the porous material with a monomer solution comprising the crosslinkable monomer. *See* [0071]. Indeed, in the Examples, e.g., Example 1, a monomer solution is applied to a microporous polyethylene membrane as a porous material and irradiated so that the monomer was crosslinked to form a crosslinked material layer.

While Nakagawa discloses a "monomer" supported on the separator, the present invention according to claim 1 has a "polymer" supported on the separator. It is clear to one of ordinary skill in the art that the reaction state of a "monomer" is different from that of a "polymer".

Thus, Nakagawa does not anticipate claim 1 since it does not disclose the claimed polymer layer comprising a crosslinking polymer in a state that the crosslinking polymer is not polymerized.

Moreover, claims 2 and 9 depend from claim 1, and thus, it is respectfully submitted that these claims are patentable for at least the same reasons as claim 1.

In view of the above, withdrawal of the rejection is respectfully requested.

II. Response to Rejection of Claims 1-9 under 35 U.S.C. § 103(a)

Claims 1-9 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yuji et al. (JP 2002-110245; hereinafter "JP '245") in view of Nakagawa.

Applicants respectfully traverse the rejection.

The Examiner acknowledges that JP '245 does not explicitly teach a coating of the crosslinking polymer composition on a porous film substrate, but discloses injecting aforementioned crosslinking polymer into an airtight container, which has units such as an electrode and battery separator. To make up for the deficiencies of JP '245, the Examiner cites Nakagawa as teaching a method of preparing a separator for a battery prepared by impregnating or coating a porous material (porous film/membrane) with a monomer solution comprising crosslinkable monomer (0071). The Examiner takes the position that it would have been obvious to one having ordinary skill in the art to use the porous film of Nakagawa as a battery separator in JP '245, motivated by the desire to avoid increase of internal resistivity of a battery and drop of high rate discharge capacity.

Applicants respectfully disagree. For an obviousness rejection, there must be some suggestion or motivation in the references or in the knowledge of one of ordinary skill in the art, to modify the references or to combine reference teachings.

JP '245 discloses a liquid polymer composition (which contains components other than the polymer, such as mixed solvent solutions of an ethylene carbonate/diethyl carbonate/dimethyl carbonate with dissolved hexafluoro-phosphate lithium) injected between an electrode and a separator. JP '245 does not disclose that the an unpolymerized polymer is applied to the surface of the porous film substrate.

Nakagawa discloses that a crosslinked material layer is formed on a porous material, and coating the porous material with a monomer solution comprising a crosslinkable monomer, as discussed above. In addition, as pointed out by the Examiner, Nakagawa discloses that coating a porous material with a monomer solution comprising a crosslinkable monomer overcomes the disadvantages of known methods.

Since the polymer composition of JP '245 contains other components and since Nakagawa accomplishes its objects by using a crosslinkable monomer solution (and an important feature of the invention does not appear to be the method of application (i.e., impregnation or coating)), one of ordinary skill in the art would not modify the process of JP '245 based on the disclosure of Nakagawa. That is, one of ordinary skill in the art would not modify JP '245 by coating a porous membrane with an unpolymerized polymer solution to arrive at the claimed invention.

Furthermore, JP '245 discloses a lithium ion secondary battery which uses a polymer solid electrolyte. On the other hand, Nakagawa discloses the liquid electrolyte comprising γ-butyrolactone as a solvent. Since the battery disclosed in Nakagawa and the battery disclosed in JP '245 are completely different, one of ordinary skill in the art would not be motivated to combine the references to arrive at the claimed invention.

For at least the above reasons, it is respectfully submitted that claims 1-9 are patentable over the cited art.

Accordingly, withdrawal of the rejection is respectfully requested.

III. Response to Nonstatutory Obviousness-type Double Patenting Rejection

Claims 1-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 1-17 of copending Application Nos. 11/267,404 and 10/569,417.

Without conceding the merits of the rejections, it is respectfully requested that the provisional non-statutory double-patenting rejections be held in abeyance.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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